

## CIVIL AERONAUTICS BOARD

## ACCIDENT INVESTIGATION REPORT

Adopted: October 17, 1951

Released: October 22, 1951

COMPANIA CUBANA DE AVIACION, S. A. AND U. S. NAVY,  
KEY WEST, FLORIDA, APRIL 25, 1951

## THE ACCIDENT

At 1149 EST<sup>1</sup> April 25, 1951, a DC-4 aircraft, Cuban registry CU-T188, operated as Trip No. 493 in scheduled service between Miami, Florida, and Havana, Cuba, by Compania Cubana de Aviacion, S. A.,<sup>2</sup> was involved in an air collision with a Navy SNB aircraft, No. 39939, which was engaged in an instrument training flight.

The collision occurred over the westerly side of the Naval Station at Key West, Florida, at an altitude of approximately 4,000 feet. All 34 passengers and the crew of five aboard the DC-4, and the four persons consisting of an instructor, two students and a radioman aboard the Navy SNB, lost their lives.

## HISTORY OF THE FLIGHT

Cubana's Trip No. 493 departed Miami at 1109, April 25, 1951, via the direct Miami-Key West Control Area Extension. The crew of five consisted of Javier Z. Bazan, captain, Jesus F. Pacheco, first officer, Pablo Valencia, purser, Pedro Martinezmoles, steward, and Orlando Salas Fernandez, observer. Mr. Fernandez was also Chief Pilot of Cubana. A request for clearance had been filed by Pan American Airways<sup>3</sup> with the Miami Air Route Traffic Control (ARTC) at 1023, requesting an altitude of 6,000 feet. The flight, while waiting in line for takeoff, was cleared by ARTC through the Miami Tower to Havana to cruise at 4,000 feet, but was instructed to maintain visual flight rules until further advised in order to provide

separation from another aircraft climbing to 6,000 feet. At 1114, Miami ARTC forwarded to PAA Flight Watch by interphone, the following message: "ATC clears Cubana 493 cruise and maintain 4,000." This clearance was delivered to the flight by PAA radio at 1119, at which time the flight advised that it was at 2,000 feet, estimating Key West at 1148<sup>4</sup> and was leaving 2,000 feet climbing to 4,000 feet. This was the last message received from the aircraft.

On the morning of the same day a twin-engine Beechcraft, Navy designation SNB No. 39939, was scheduled for a simulated instrument training flight from the U. S. Naval Air Station,<sup>5</sup> Key West, Florida, at 1120. The flight, to be conducted under visual flight rules, had no altitude or area assignment other than that necessary to accomplish the training mission. One portion of the mission requires a flight inbound on the east leg of the Key West Radio Range on a heading of 250° M, at an air speed of 140 knots. Upon recognition of the cone, the pilot proceeds outbound on the west leg of the range on a heading of 279°, reduces speed to 105 knots, lowers the landing gear and descends to an altitude of 1,300 feet. A procedure turn is then made and the prescribed pattern followed for a simulated instrument approach to Boca Chica Airport (See Appendix I).

The aircraft departed the air station ramp with Pilot-Instructor Robert Iowler Stuart, Lt (jg), USN, occupying the left pilot seat, Eugene Samuel Eardsley, Ensign, USNR, occupying the right pilot seat, and

<sup>4</sup> Key West, Florida, is a reporting point for Cubana but not a scheduled stop.

<sup>5</sup> This air station is at Boca Chica Airport which is located approximately 5.6 statute miles northeasterly from the Key West Radio Range Station.

<sup>1</sup> All times referred to herein are Eastern Standard and based on the 24-hour clock.

<sup>2</sup> Hereinafter referred to as "Cubana."

<sup>3</sup> Pan American Airways acts as U. S. Agent for Cubana at Miami.

Francis Lavelle Ready, Midshipman, USN, and Alfred Leroy Gasser, Aviation Radioman, First-class, occupying undetermined seats in the aircraft's cabin. The Navy Tower cleared the flight and takeoff was made at 1126. After takeoff, tower frequency was cleared and since the subject aircraft was on a standby status for Air-Sea Rescue purposes, a routine radio contact was made with the Ground Control Intercept Unit at 1128. However, no altitude or position was given. This was the last known contact made with this aircraft.

At 1149 the Cubana DC-4, on a southerly heading, and the Navy SNB, on a westerly heading, collided at a point over the westerly edge of the U S Naval Station at an estimated altitude of 4,000 feet. As a result, the Navy aircraft crashed into the water just west of the Naval Station. The Cubana aircraft, however, continued on for some distance before entering a left bank which became progressively steeper until the aircraft assumed a nose-down attitude. In this position, it crashed into the ocean approximately 1.7 miles southeast of the point of collision.

#### INVESTIGATION

Shortly before the collision the Cubana DC-4 was observed by ground witnesses about one mile north of the center line of the direct Miami-Key West Control Area Extension. The altitude was estimated as 4,000 feet, and the heading approximately 223° M. At about the same time and approximately the same altitude, the Navy SNB was observed on the east leg of the Key West Radio Range, approaching the station on a heading of about 250°. Witnesses saw the two aircraft collide at a point approximately 1.6 miles west of the Range Station and just north of the on-course signal. The U S Naval Station Duty Officer At Key West was informed of the accident at 1150. However, the identity of the aircraft was not known at this time. By 1200, it became apparent to the station that the crash was one of major proportions and steps were immediately initiated to activate all rescue and salvage facilities within the area. Search and salvage operations were begun immediately and shortly thereafter the aircraft involved were identified. The salvage operations

continued for seven days involving nearly all of the Key West Naval Station components and local Coast Guard units. In general, the operations consisted of recovery of bodies and personal effects and subsequent identification and care. The search for and salvage of the wrecked aircraft consisted of and resulted in:

1 Recovery and identification of the 39 bodies from the DC-4 and two from the SNB

2 Thorough search of the sea bottom within a radius of approximately 500 yards around each wrecked aircraft

3 Search of other extensive areas where witnesses reported seeing objects falling into the water

4 Recovery of approximately 88 per cent of the structure of the Cubana DC-4

5 Recovery of approximately 80 per cent of the structure of the Navy SNB

6 Use of 20 Navy divers, a total of 680 hours of actual diving time

All recovered portions of the SNB were located approximately 548 yards off shore west of the U S Naval Station. In this same area were found all the recovered portions of the DC-4 left wing outboard of No. 1 engine nacelle. Practically all the remaining portions of the DC-4 which were recovered were found in about 25 feet of water approximately 1.7 miles southeast of the point of collision.

Among the recovered portions of both aircraft, sufficient evidence was found to establish the position of the aircraft relative to each other at the moment of initial impact. The right propeller of the SNB had deep gouges on the leading edge of both blades. The section of the DC-4 left wing recovered with the SNB wreckage showed evidence of having been cut by a revolving object at wing stations 588 1/2 and 540 1/2, the cutting action being from the front to the rear of the wing and parallel to the longitudinal axis of the DC-4. The cut on the DC-4 left wing at station 588 1/2, which was made by one blade of the right propeller of the SNB, was the first contact between the two aircraft. The cut in the DC-4 left wing at station 540 1/2 by the second blade of the SNB right propeller, and the contact of the tip and leading edge of the DC-4 left wing with the

right side of the SNB fuselage, followed almost simultaneously. There was evidence of subsequent impact between the two aircraft, however, the damage was of such a nature that it was not possible to determine any sequence of events. The SNB propeller cuts in the DC-4 left wing indicated that the angle between the longitudinal axis of the two aircraft at the moment of impact was approximately  $110^{\circ}$  (See Appendix II).

The Cubana DC-4 and its crew were properly certificated in accordance with the requirements of the Cuban Civil Aeronautics Administration. The aircraft was equipped to receive and transmit on all radio frequencies required for the route involved, and at time of departure was loaded within the allowable gross weight and center of gravity limits. The flight was properly dispatched, and cleared by the Miami ARTC in accordance with Instrument Flight Rules.

The route of this flight, as prescribed by Cubana's Operations Manual and the ARTC clearance, was over the Control Area Extension direct from Miami to Key West, recently established and published in the Civil Aeronautics Administration Airman's Guide, Volume 5, No 24, dated February 13, 1951. The magnetic course from Miami to Key West on this airway extension is  $223^{\circ}$ .

The Navy aircraft was properly scheduled and dispatched. Records indicate that it was loaded within the allowable gross weight and center of gravity limits prescribed by the U S Navy. They indicate further that the aircraft was equipped to receive and transmit on 3265 kilocycles and 143 23 megacycles, plus standard radio range frequencies.

For operation under simulated instrument conditions, the aircraft was equipped with orange-colored plexiglass, detachable windshield panels covering all sections of the windshield but not the sliding window panels on either side of the cockpit. A student under instruction wearing the proper colored goggles is unable to see through the windshield, but retains the usual vision within the cockpit. However, the visibility of the instructor and other crew members is unrestricted.

The Key West Radio Range was given a visual and aural check at approximately 1000 on the day of the accident, at which time normal

operation was indicated. At 1150 on the same date, immediately after the accident, the aural and visual monitor indicated normal operation.

The Key West weather at 1124 was reported as scattered clouds at 2600 feet, 15 miles visibility, temperature  $81^{\circ}$ , dewpoint 68, wind east-northeast 13, altimeter setting 30.09. Two-tenths sky coverage was recorded at 1124 and 1225, however, the pilot of National Airlines' Flight 457, Miami to Havana, stated that when he passed over Key West at 1141 at 8000 feet, the weather was clear and unlimited. The sun's altitude at the U S Naval Base at 1149 on the date of the accident was 76 degrees, 54 minutes at  $138^{\circ}$  azimuth. At 1220, it reached the peak altitude of 80 degrees at  $180^{\circ}$  azimuth. Neither the weather nor the sun's position is considered a contributing factor in this accident.

#### ANALYSIS

The heading from Miami to the Key West Radio Range Station, via the Control Area Extension, is  $223^{\circ}$  M. From the Key West Range to Havana, the heading is  $197^{\circ}$  M.

Shortly before the accident, ground witnesses observed a four-engine aircraft about a mile north of the center line of the Miami-Key West Control Area Extension proceeding on a heading of approximately  $223^{\circ}$  and at an estimated altitude of 4,000 feet. While no witness was found who followed this aircraft on to the point of collision, it must be presumed to have been the Cubana aircraft since its estimated time of arrival over Key West was 1148, and no other aircraft of this type is known to have been in the area at that time. From the testimony of witnesses, it would appear that the collision occurred while the DC-4 was in a gentle left bank or had just leveled out on the new Havana heading of  $197^{\circ}$  M.

Shortly before the accident, a Navy SNB was observed at an estimated altitude of 4,000 feet approaching along the east leg of the Key West Radio Range, which heading toward the Station is  $250^{\circ}$  M. Since this training flight involved simulated instrument approaches on the Key West Radio Range, it is assumed that such an approach was being made at the time of the collision. This assumption is further supported by the fact

that the collision occurred at a point where the aircraft would normally have been shortly after over-heading the Range Station. As no evasive action by either aircraft was observed, it is apparent that the crews either did not see each other or saw each other too late to avoid collision.<sup>6</sup>

#### FINDINGS

Upon the basis of all available evidence, the Board finds that

1 The air carrier, Compania Cubana de Aviacion, S. A., is authorized to engage in air transportation of persons, property, and mail between Havana, Cuba, and Miami, Florida, by "Permit to Foreign Air Carrier," Docket No. 1887, issued by the Civil Aeronautics Board.

2 The aircraft and crew were currently certificated by the Cuban Civil Aeronautics

Administration, and the flight was properly dispatched from Miami on an IFR Flight Plan.

3 The Navy aircraft was airworthy, properly dispatched, and its crew qualified for the subject flight.

4 The weather in the Key West area at the time of the accident was clear and unlimited.

5 The flight of each aircraft was routine and according to plan up to the time of collision.

6 The collision resulted in the destruction of both aircraft and the death of all occupants.

#### PROBABLE CAUSE

The Board determines that the probable cause of this accident was failure of crews of both aircraft to maintain sufficient vigilance under VFR conditions to prevent a collision.

#### BY THE CIVIL AERONAUTICS BOARD

/s/ DONALD W. NYROP

/s/ OSWALD RYAN

/s/ JOSH LEE

/s/ JOSEPH P. ADAMS

/s/ CHAN GURNEY

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<sup>6</sup> The Chairman of the Board, in a letter to the Administrator of Civil Aeronautics, suggested that appropriate personnel of the Civil Aeronautics Administration and the Civil Aeronautics Board review present Air Traffic Control procedures and existing operational practices in this area.

# Supplemental Data

## INVESTIGATION AND HEARING

The Civil Aeronautics Board Miami office, was notified at 1216, April 25, 1951, by the Miami Civil Aeronautics Administration Communications Station that Cubana's Flight No 493 was overdue at check point, Key West, Florida. At 1340, additional information was received that an air collision had occurred in the Key West area at 1149. The Board immediately initiated an investigation in accordance with the provisions of Section 702 (a)(2) of the Civil Aeronautics Act of 1938, as amended. A public hearing was held in Key West, Florida, May 16, 17, and 18, 1951, as part of the investigation.

## AIR CARRIER

Compania Cubana de Aviacion, S. A., is a Cuban corporation with headquarters at Havana, Cuba, and has been authorized by the Republic of Cuba to operate in scheduled air service since October 8, 1949. On May 15, 1946, Cubana inaugurated scheduled service between Miami, Florida, and Havana, Cuba, under "Permit to Foreign Air Carrier," Docket No. 1887, issued by the Civil Aeronautics Board.

## FLIGHT PERSONNEL

Captain Javier Z. Bazan, age 50, held current Republic of Cuba CAA Airline Pilot License No. 24 with 3D rating. His total time as pilot was 12,158 hours, 1317 hours of which were in the type of equipment involved. His total instrument time was 370 hours. His last physical examination by the Cuban CAA Flight Examiner was accomplished March 18, 1951. He had been employed since September 2, 1938, by Cubana.

First Officer Jesus F. Pacheco, age 29, held current Republic of Cuba CAA Airline Pilot License No. 287 with 3F rating. He had been employed by Cubana since October 13, 1941, and had accumulated a total of 4,557 hours, of which 2,791 hours were in the type of equipment involved. His last physical examination was accomplished March 21, 1951.

Orlando S. Fernandez, chief pilot since March 19, 1949, was first employed by Cubana

on December 1, 1935. He had a total time of 9,451 hours, of which 363 hours were in the type of equipment involved. He held Airline Pilot License No. 71 with 3D rating issued by the Cuban CAA. His last physical examination was accomplished November 18, 1950.

## CUBANA AIRCRAFT

The Cubana aircraft was a C54B, Serial No. 10368, Cuban registration CU-T188, manufactured by Douglas Aircraft Company in August 1944 for the U. S. Army Air Force. It was purchased by the Pan American Grace Airways, Inc., and modified on April 13, 1947, by the Douglas Aircraft Company to a DC4-B, after having accumulated 1,970 hours flight time. The aircraft was purchased from Pan American Grace by the Pan American World Airways on November 22, 1947, and on April 1, 1948, was leased to the Cubana company with an option to purchase, which option was exercised by Cubana on August 1, 1948. The aircraft was in operation on the various routes of the company until the day of the accident. The total accumulated time was 13,218 hours.

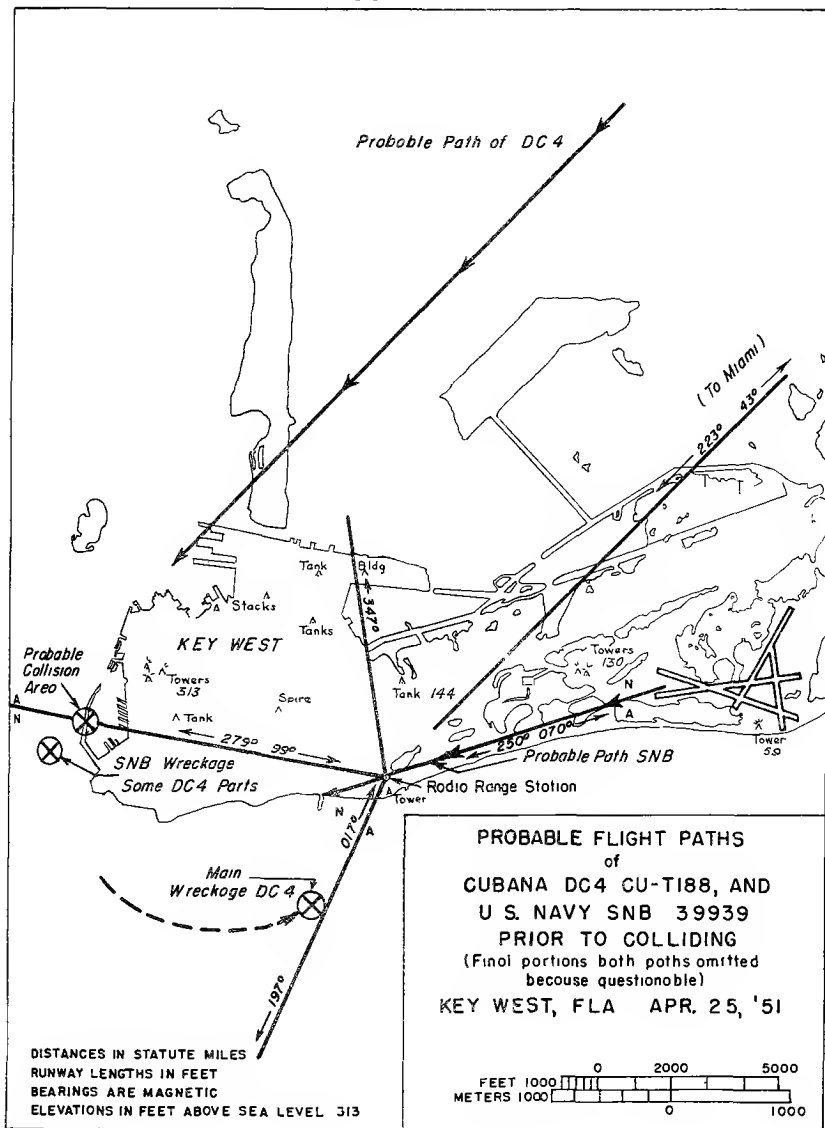
## NAVY AIRCRAFT

The Navy aircraft was a Beechcraft, Model SNB-5, carrying Bureau No. 39939. It was equipped with two Pratt & Whitney engines, Model R-985-AM-3, and with Hamilton Standard propellers, Model No. 2D30-237. Navy records indicate the aircraft to have been in an airworthy condition and to have accumulated a total time of 993 hours.

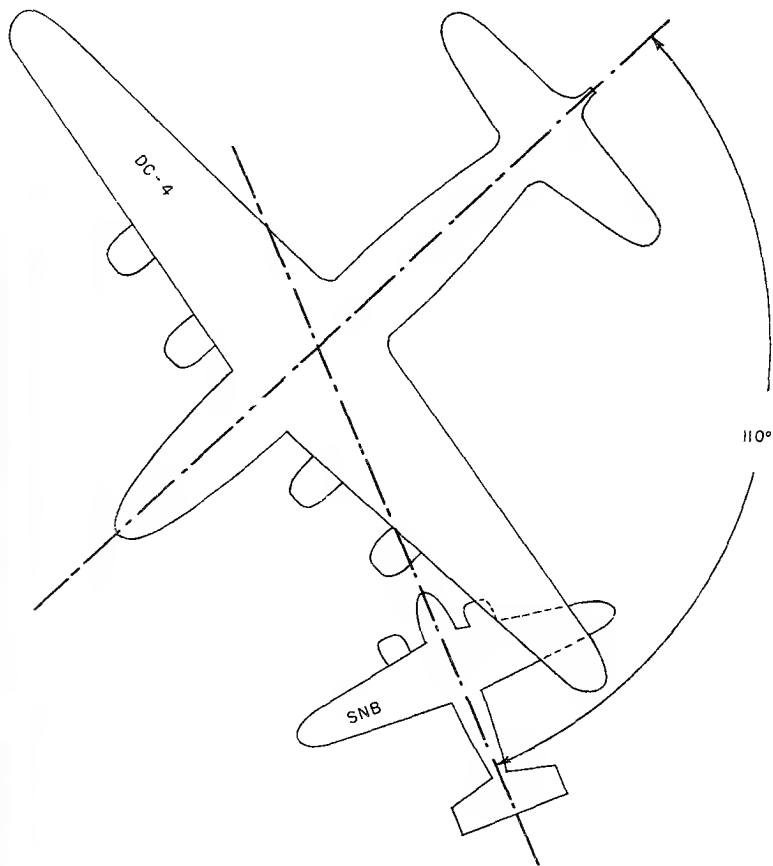
## NAVY FLIGHT PERSONNEL

Robert L. Stuart, Lt. (jg) USN, (Instructor), Francis L. Ready, Midshipman USNR, and Eugene S. Bardsley, Ensign USNR, were qualified naval aviators attached to the Fleet All-Weather Training Unit, Atlantic. The physical examinations of these men showed no waivers or defects. Lt. Stuart's last physical was accomplished on December 11, 1950. The fourth member of the crew was A. L. Gasser, Radioman, First-class, USN.

# Appendix I



## Appendix II



ANGLE OF COLLISION AS DETERMINED BY EXAMINATION OF WRECKAGE  
CUBANA DC-4 CU-T188 AND U S NAVY SNB 39939  
KEY WEST, FLA APR 25, '51